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APPROVAL OF UNDP ASSISTANCE TO A PROJECT OF CHINA

IPF:(1992-96) $176 600 000
(CPR/91/271) - Transfer of Technology to Design, Engineer, Construct and Operate Associated Petroleum Gas Processing Plants

Date of approval by the AC:[1/]	3 June 1992
Expected duration:	Four years
Proposed executing agency:	Government
Government implementing agency:	Lanzhou Petroleum Machinery Research Institute (LPMRI) under Ministry of Machinery and Electronic Industry
Proposed UNDP contribution:	$1 960 900 Source of funds: IPF
Third-party cost sharing:	$ 481 000 Source of funds: LPMRI in cooperation with Inner Mongolian Oil Producers
Total UNDP budget:	$2 441 900

Project background

The Government of China's priority task has been to feed and house her massive population of over one billion. As part of the strategy to achieve this, China has adopted, and is working to improve an energy policy to overcome the constraints in the current energy programme that is struggling to meet demand and relies heavily on coal. Indeed, the current five-year Plan includes an ambitious energy programme which calls for an increase in oil and gas production whilst improving recovery from all sources of energy. The programme also targets improvement of energy supply to people in remote areas and reduction of air pollution through a reduction of coal use.

Oil is providing an increasing source of energy, While present crude production is approximately 3 million barrels per day, most of which comes from large-scale fields. However, efficient exploitation of smaller fields is of increasing importance. The production of crude oil is accompanied in most cases by the production of associated gas which is separated from the crude oil at or near the well head and generally flared, contributing to pollution and global warming. If not flared, the environmental impact is even worse. A multitude of small oil fields are scattered throughout the country, often in very remote locations. The problem of effectively utilising associated gas from these small fields is particularly difficult since the wells do not produce enough to justify piping, even if a conveniently located market existed.

Although it is often not economic for a major corporation to be involved in such small operations, nevertheless the amount of associated gas being flared from all these small wells is approximately 1 billion cubic metres per year, equivalent to 1 million tons of oil worth $ 200 million per year. At the same time, even highly developed economies utilize liquid petroleum gas in rural and remote areas and is particularly cost effective in areas not serviced by gas or electricity mains. This liquid gas (NGLs) can be bottled, stored and transported at relatively low cost and at ambient temperatures. They are clean burning and

[1/] **This Fact Sheet reflects the status of the project/revision at the time it was approved by the Action Committee; modifications to the project/revision may have occurred subsequently.**

also an important input for the petrochemical industry. Also LPGs (for remote communities) and Ethane (for ethylene) can be separated from the NGLs. To introduce the capacity to design, manufacture, install and operate inexpensive skid mounted NGL recovery plants at remote well sites and subsequently transport gas, the Government requested UNDP assistance under the present approval.

Description of project

The project aims at developing the design engineering, procurement, construction and operating capability in the Lanzhou Petroleum Machinery Research Institute (LPMRI), for small skid-mounted natural gas liquids recovery plants. This will be done through a two-phased approach. First the project will assist LPMRI to select appropriate technology, design, manufacture and conduct demonstration tests of a skid-mounted Natural Gas Liquid recovery plant which will have the advantage of being usable in remote areas and moveable when small wells/field give out. This will be achieved through a subcontract for engineering services. The resulting plant, designed for smaller to medium-sized oil fields, will be used to demonstrate the practicality and economies of gas recovery and the capacity of the institute to design, construct and operate additional plants.

Secondly, the project aims to develop LPMRI's capability to evaluate and study the economic and technical feasibility of recovering NGLs at other remote sites and at off-shore wells; recommend safe, ecologically sound and economical ways of handling associated gases; promote the design, manufacture, marketing and use of recovery plants found to be economically and technically feasible; and upgrade LPMRI's capacity to use computer aided design and engineering techniques. This will be achieved through fielding of appropriate consultant specialists. All aspects of the project will benefit from study tours and locally organized seminars and formal training classes. At the end of the project, and after at least one year of on-site testing of the prototype it is expected that feasibility studies will have been completed for at least four small plants to be ordered by operating companies for installation in remote locations.

Overall, the project will operate under the guidance of a coordination committee made up of the National Petoleum and Gas Corp., the Ministry of Machinery and Electronics, the LPMRI, and the district operating oil companies (end-users).

Inputs

UNDP will provide 29.2 man-months of international consultants with expertise in process design, engineering design, CAP applications, NGL recovery and short-term consultants addressing issues of planning, cost estimation, economic viability, commercial and business uses of the plants and the gas; three sub-contracts for computer software, process design and detailed engineering design; fellowships for process, chemical and design engineering, study tours, conferences and seminars and on-the-job training; equipment for the demonstration plant, test laboratory, and computer design; and miscellaneous costs.

Financial data

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Personnel	338 900
Subcontract	760 000
Training	378 000
Equipment	962 000
Miscellaneous	3 000
Total	2 441 900

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